



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
|-----------------|-------------|----------------------|---------------------|------------------|

09/874,027

06/06/2001

Ioan Dancea

6802

40793

7590

02/03/2005

IOAN DANCEA
3, RUE D'HOCHELAGA
GATINEAU, QC J9J 1H7
CANADA

EXAMINER

FERRIS III, FRED O

ART UNIT

PAPER NUMBER

2128

DATE MAILED: 02/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/874,027

Applicant(s)

DANCEA, IOAN

Examiner

Fred Ferris

Art Unit

2128

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 June 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2 and 10 is/are rejected.
- 7) ☒ Claim(s) 3-9,11 and 12 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 June 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☒ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 6/6/01.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

1. *Claims 1-12 have been presented for examination based on applicant's disclosure and preliminary amendment filed on 06 June 2001. Claims 1, 2 and 10 have been rejected by the examiner. Claims 3-9 and 11-12 have been objected to.*

Priority

2. *Acknowledgment is made of applicant's claim for foreign priority based on an application no. CA2338458 filed in Canada on 27 February 2001. It is noted, however, that applicant has not filed a certified copy of the Canadian application as required by 35 U.S.C. 119(b).*

Drawings

3. *The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the must be shown or the features canceled from the claims. No new matter should be entered.*

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

MPEP Section 608.02(d) [R-2] "Complete Illustration in Drawings" recites the following:

"37 CFR 1.83. Content of drawing.

(a) The drawing in a nonprovisional application must show **every feature** of the invention **specified in the claims**. However, conventional features disclosed in the description and claims, where their detailed illustration is not essential for a proper understanding of the invention, should be illustrated in the drawing in the form of a graphical drawing symbol or a labeled representation"

In this case, none of the drawings (Figs. 1-11) show elements or features of the logical summing circuit recited in independent claim 1 or the equivalence gates recited in claim 2. While the examiner believes these elements may be present in the circuit disclosed in figures 2A and 2B, neither the claimed logical summing circuit, nor the equivalence gates are specifically identified in any of the drawings.

Claim Objections

4. Claims 8-10 are objected to because of the following informalities:

The word "realised" is misspelled and should be spelled "realized" in claims 8 and 9. In claims 10 the words "analsing and analse" are misspelled and should be spelled "analyzing and analyze". Also, the bullets before the terms "means to" in claim 10 are improper and the phrase "where interpreting and analyzing:" does not make sense in the context of the claim. The examiner suggests rewording the phrase to read "where interpreting and analyzing said system comprises:" and removing the bullets before the "means" limitations. Appropriate correction is required. The examiner also encourages applicants to amend claim 10 to use "means for" language, (i.e. means for validating, means for analyzing, means for generating, etc.), in lieu of "means to"

language. This amendment to the claim language would properly invoke 35 USC 112, 6th paragraph. (see allowable subject matter below)

Claim 11 is objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim may not be cumulative and may refer in the alternative to only one set of claims. See MPEP § 608.01(n). Accordingly, the claim has not been further treated on the merits.

MPEP § 608.01(n) recites the following:

“Generally, a multiple dependent claim is a dependent claim which refers back in the alternative to more than one preceding independent or dependent claim. The second paragraph of 35 U.S.C. 112 has been revised in view of the multiple dependent claim practice introduced by the Patent Cooperation Treaty. Thus 35 U.S.C. 112 authorizes multiple dependent claims in applications filed on and after January 24, 1978, as long as they are in the alternative form (e.g., “A machine according to claims 3 or 4, further comprising ---”). Cumulative claiming (e.g., “A machine according to claims 3 and 4, further comprising ---”) is not permitted. A multiple dependent claim may refer in the alternative to only one set of claims. A claim such as “A device as in claims 1, 2, 3, or 4, made by a process of claims 5, 6, 7, or 8” is improper. 35 U.S.C. 112 allows reference to only a particular claim. Furthermore, a multiple dependent claim may not serve as a basis for any other multiple dependent claim, either directly or indirectly. These limitations help to avoid undue confusion in determining how many prior claims are actually referred to in a multiple dependent claim. A multiple dependent claim which depends from another multiple dependent claim should be objected to by using form paragraph 7.45.”

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. **Claim 2 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.**

Per dependent claim 2: Dependent claim 2 recites limitations relating to a "second intermediate result to produce a logical value which is the value of the product term: if **"this"** value is logical 1" and a "third AND gates means to allow **"passing"** said function word" which render the claim indefinite. MPEP 2171 requires the following:

2171 Two Separate Requirements for Claims Under 35 U.S.C. 112, Second Paragraph

The second paragraph of 35 U.S.C. 112 is directed to requirements for the claims:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

There are two separate requirements set forth in this paragraph:

- (A) the claims must set forth the subject matter that applicants regard as their invention; and*
- (B) the claims must particularly point out and distinctly define the metes and bounds of the subject matter that will be protected by the patent grant.*

In the first case, the term "this value" is indefinite since it is unclear which value is being referred to. In the second case, the term "passing" is indefinite since it is unclear where the function word is passing. The examiner therefore submits that one skilled in the art would be at odds to determine the meaning of the terms **"this value"** and **"passing"** in the context of the claim language. The examiner suggests replacing the word "this" with the term "second intermediate" (i.e. second intermediate value) and replacing the word "passing" with the text defining the actual destination of the function word.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claim 10 is rejected under 35 U.S.C. 102(b) as being clearly anticipated by “Dynamically Changing the Logical Behavior of a Microcomputer Interface”, I. Dancea, IEEE Micro, April 1989. (of record)

Independent claim 10 merely recites an expert system for analyzing digital circuit behavior including validating variables, analyzing logical equations, generating product term words, and transforming product term lists defining logical behavior.

Dancea discloses an expert system (pp. 43-48) inclusive of analyzing digital circuit behavior including validating variables (Figs. 4-5), analyzing logical equations (pp. 49-50, Figs. 4-5), generating term (mask, product, function) words (Figs. 4-8, 12), and transforming product term lists defining logical behavior (Figs. 4-5). The examiner notes that, while the referenced article represents applicant's own work, all of the elements of the claimed limitations in independent claim 10 are disclosed. Since this article was published in April of 1989 it clearly qualifies as prior art under 35 USC 102(b).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,034,546 issued to Jones et al in view of U.S. Patent 6,212,670 issued to Kaviani.

Independent claim 1 recites a circuit technique for implementing a combinatorial circuit with functions expressed in sum-of-product equations implemented, a register storing input variables, multiple cells, a product term cell, and summing circuit receiving product term values.

Jones discloses a VLSI circuit technique for implementing a combinatorial circuit (CL7-L32, Fig. 2) inclusive of functions expressing in sum-of-product equations (CL1-17, Fig. 1), a register storing input variables (Abstract, CL1-41, CL7-L5-33, Fig. 2),

multiple cells (Fig. 2-5, CL4-42), and summing circuit receiving product term values (CL4-L15-57, CL7-L4-59, Fig. 2).

Jones does not explicitly disclose the use a product term cell.

Kaviani specifically discloses the use a product term cell for determining the logical value of the product term equations from the inputs. (CL1-L35, CL2-L23-53, Figs. 1-3)

It would have been obvious to one having ordinary skill in the art at the time the claimed invention was made to modify the teachings of Jones relating to implementing combinatorial circuits using sum-of-product equations, with the teachings of Kaviani relating to the use of product term cells, to realize the claimed invention. An obvious motivation exists since, in this case, the Jones reference teaches to the Kaviani reference, and the Kaviani reference teaches to the Jones reference. Specifically, both Jones and Kaviani teach programmable circuits for implementing combinatorial circuits using sum-of-product equations and are drawn to the same technical arena as noted above. Jones teaches to Kaviani because Jones discloses that combinatorial circuits can be implemented using sum-of-product equations and programmable cells. (See: Jones, Background). Kaviani teaches to Jones because Kaviani also teaches implementing combinatorial circuits using sum-of-product equations but specifically discloses using a product term cell. (See: Kaviani, CL1-35) Further, the level of skill required by an artisan to realize the claimed limitations of the present invention is clearly established by both references. (See: Jones/Kaviani, Abstracts) Accordingly, a skilled artisan having access to the teachings of Jones and Kaviani, would have knowingly

modified the teachings of Jones with the teachings of Kaviani (or visa versa) to realize the claimed elements of the present invention.

Allowable Subject Matter

8. *Claims 3-9 and 12 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims and providing that issues relating the 112(2) rejections and informalities note above are resolved. In this case, applicants are encouraged to amend dependent claims 2 and 12 to include the limitations of independent claim 1. (i.e. claims 2 and 12 would be independent claims with claims 3-9 depending from 2) At such time the "means for" language of claims 2 and 12 could be given deference in view of *In re Donaldson* (U.S.C. 112, Sixth Paragraph) and the examiner would favorably consider the allowance of claims 2-9 and 12. (See MPEP 2181) In particular, the prior art of record does not explicitly disclose the specific arrangement of elements of the cell C(k) and first AND gate means for, equivalence gates means for, and second AND gate means for as disclosed in applicant's specification on pages 7-18 and in figures 2A-4, and 6-7.*

Conclusion

9. *The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Careful consideration should be given prior to applicant's response to this Office Action.*


U.S. Patent 6,662,323 issued to Asher et al teaches combinatorial circuits using sum-of-product equations.

U.S. Patent 6091,892 issued to Xue et al teaches combinatorial circuits using sum-of-product equations.

U.S. Patent 5,309,046 issued to Steel teaches combinatorial circuits using sum-of-product equations.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Fred Ferris whose telephone number is 571-272-3778 and whose normal working hours are 8:30am to 5:00pm Monday to Friday. Any inquiry of a general nature relating to the status of this application should be directed to the group receptionist whose telephone number is 571-272-3700. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jean Homere can be reached at 571-272-3780. The Official Fax Number is: (703) 872-9306

Fred Ferris, Patent Examiner
Simulation and Emulation, Art Unit 2128
U.S. Patent and Trademark Office
Randolph Building, Room 5D19
401 Dulany Street
Alexandria, VA 22313
Phone: (571-272-3778)
Fred.Ferris@uspto.gov
January 14, 2005



Handwritten signature of Fred Ferris, dated 1/14/2005.